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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/550,506

09/23/2005

Yizhou Song

P05,0328

9959

26574 7590 07/28/2009

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EXAMINER

BAND, MICHAEL A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/28/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/550,506	Applicant(s) SONG ET AL.	
	Examiner MICHAEL BAND	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 10 and 15-28 is/are pending in the application.
- 4a) Of the above claim(s) 9, 10 and 22-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/1/2009 has been entered.

Election/Restrictions

2. Newly submitted claims 22-28 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 22-28 are directed towards an apparatus of nonelected Group II in the Response to Restriction filed 6/20/2008.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 22-28 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 15-16 and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Hartsough (US Patent No. 4,420,385).

With respect to claims 15-16 and 18-19, Hartsough discloses a method for forming a thin film on a substrate [40] where a process chamber [24] has a sputter zone [62] and a chemical reaction zone [70] (abstract; figs. 1-2), where the sputtering is of a metal using an argon source [34] and the reaction zone [70] uses an oxygen source [31] (fig. 2; col. 2, lines 14-17). It is expected that some portion of the argon source [34] diffuses into the chemical reaction zone [70]. Hartsough further discloses sputtering the aluminum onto the substrate [40] in the sputtering zone [62], where said substrate [40] is then rotated into the reaction zone [70] so that the aluminum reacts with the oxygen to form a dielectric (i.e. compound) thin film of Al_2O_3 (col. 2, lines 29-36). Hartsough also discusses repeatedly exposing the substrate [40] to the sputtering zone [62] and reaction zone [70] until the dielectric Al_2O_3 film on said substrate [40] reaches a desired thickness (col. 4, lines 54-59). Fig. 5 depicts selectively controlling the speed of a substrate table (i.e. holder) [26] in regards to material deposition by adjusting from a stopped position (i.e. 0 rpm) to a range between 60 and 400 rpm, where fig. 1 depicts said substrate table [26] as cylindrical with the substrate [40] near an outer peripheral

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face. The optical characteristics being in a hysteresis region are inherent because all method limitations are met. If not, it must be due to limitations that are not claimed. Fig. 2 also depicts a flow controller [30] for the oxygen source [31], with Hartsough stating that oxygen partial pressure is set (i.e. increased or decreased) in regards to the rotational speed of the substrate table [26] (col. 6, lines 47-68). Since the oxygen partial pressure is either increased or decreased via flow controller [30] based upon the substrate table [26] speed, the increase or decrease of an oxygen flow rate is therefore based upon the speed of said substrate table [26] as well.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartsough (US Patent No. 4,420,385) as applied to claim 15, and further in view of Sproul et al (US Patent No. 5,789,071).

With respect to claims 18 and 21, the reference is cited as discussed for claim 15. However Hartsough is limited in that while a partial pressure of the reactive gas is specified, a specific flow rate is not suggested.

Sproul et al teaches multilayer oxide coatings, specifically of aluminum oxide (Al_2O_3) (col. 9, lines 42-49). Sproul et al further teaches the appropriate partial pressure

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of oxygen is selected from the hysteresis curve which relates to oxygen gas flow (col. 10, lines 54-57), with a Table on col. 11 depicting a partial oxygen pressure of 0.03 mTorr. Sproul et al also teaches that referring to fig. 5, when the optimal partial pressure of oxygen is in the range of 0.02 mTorr, the oxygen flow is constant in the range of 15 to 20 sccm (col. 8, lines 63-66).

It would have been obvious to one of ordinary skill in the art to use the oxygen flow rate of Sproul et al for the flow rate of Hartsough since Hartsough fails to specify a flow rate and one of ordinary skill would have a reasonable expectation of success in making the modification since Sproul et al has shown similar oxygen partial pressures as those of Hartsough in the sputtering of aluminum.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hartsough (US Patent No. 4,420,385) as applied to claim 15, and further in view of Matsumoto et al (US Patent No. 6,287,430).

With respect to claim 20, the reference is cited as discussed for claim 15. However Hartsough is limited in that while one target of Al is specified, having two targets capable of switching as anode and cathode is not suggested.

Matsumoto et al teaches a method of forming a thin film (abstract), where fig. 7 depicts a process chamber [10] comprising a sputtering zone having sputter targets [41a], [41b] with an argon source [44] and a chemical reaction zone with an oxygen source [35a], with fig. 6 depicting a substrate holder [20] rotating between said sputtering zone and said chemical reaction zone. Matsumoto et al further discloses the sputter targets [41a], [41b] comprise Al (col. 10, lines 58-65), where said sputter targets

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[41a], [41b] operate with one target [41a] being a cathode and a second target [41b] being an anode, with said sputter targets [41a], [41b] alternating between anode and cathode (col. 11, lines 24-40). Matsumoto et al cites the advantage of using two sputter targets alternating between cathode and anode as attaining a film with good reproducibility (col. 51-58).

It would have been obvious to one of ordinary skill in the art to incorporate two sputter targets taught by Matsumoto et al in place of the one sputter target of Hartsough to gain the advantage of attaining a film exhibiting good reproducibility.

Response to Arguments

103 Rejections

8. Applicant's arguments with respect to claims 15-21 have been considered but are moot in view of the ground(s) of rejection due to the new claims which have been addressed in the rejections above.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

/Jennifer K. Michener/

Supervisory Patent Examiner, Art Unit 1795